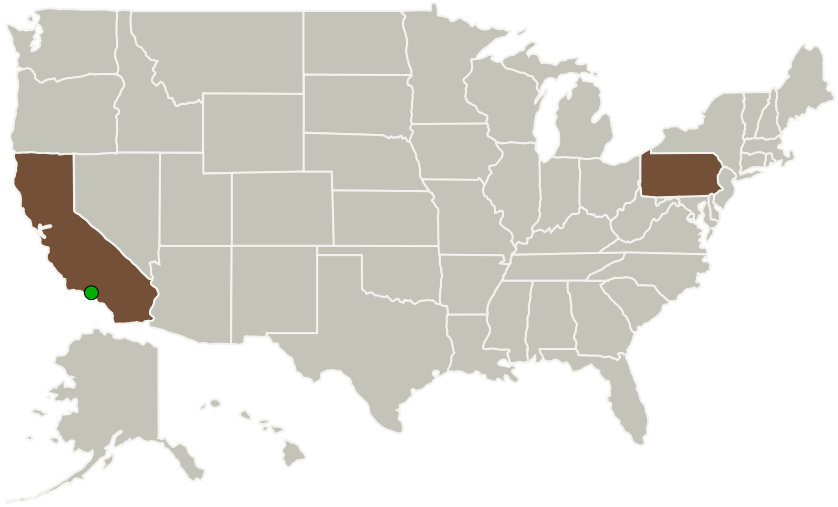
Autolanding for Sample Return Missions, Phase I

Completed Technology Project (2014 - 2014)

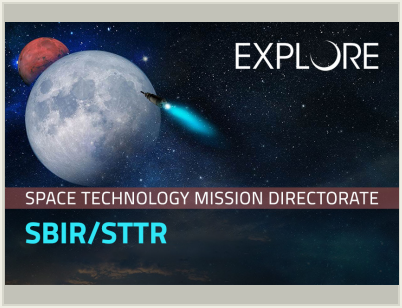
Project Introduction

Future NASA and commercial missions will increasingly target destinations with challenging topography and limited communication including unmapped asteroids, comets, and outer planet moons; surface rendezvous sites for sample return; and challenging sites like polar peaks, crater rims, and skylights on Mars and the Moon. Given the hazards of exploring these destinations, robotic landers will most likely precede human mission, as they can significantly cut mass, size and cost relative to human-relevant landers without compromising human safety. However, a reduced lander size equates to reduced hazard tolerance, placing a strong demand on precise autonomous hazard detection and landing. The proposed research innovates safe, precise navigation for autolanding for sample return missions to a distant asteroid, planet, or moon. The technology suite developed will be packaged as a commercial product

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Astrobotic Technology, Inc.	Lead Organization	Industry	Pittsburgh, Pennsylvania
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California



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Primary U.S. Work Locations	
California	Pennsylvania

Project Transitions

June 2014: Project Start

December 2014: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/137499)*

Images

Briefing Chart
Autolanding for Sample Return Missions, Phase I
(https://techport.nasa.gov/image/130081)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Astrobotic Technology, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

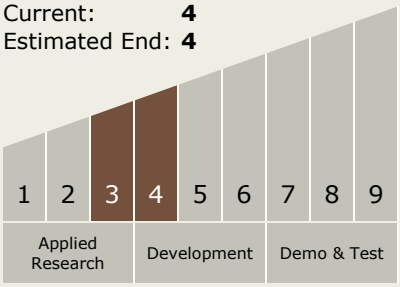
Carlos Torrez

Principal Investigator:

Kevin Peterson

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX17 Guidance, Navigation, and Control (GN&C)
  - TX17.2 Navigation Technologies
    - TX17.2.5 Rendezvous, Proximity Operations, and Capture Sensor Processing and Processors

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System